For discussion
on 4 October 2018

House Committee

The Government's preparations, emergency response and recovery efforts arising from Super Typhoon MANGKHUT

Purpose

This paper briefs Members on the Government's preparedness, emergency response and recovery efforts arising from Super Typhoon MANGKHUT.

Background

Super Typhoon MANGKHUT

2. MANGKHUT is by far the strongest Tropical Cyclone (TC) worldwide in 2018. Prior to making landfall over Luzon, the Philippines on 15 September 2018, MANGKHUT intensified into a Super Typhoon, reaching a peak sustained wind speed at 250 km per hour. After traversing Luzon, MANGHKUT battered Hong Kong and the nearby region on 16 September 2018. TC Warning Signal No. 10 was issued and remained in force for ten hours, five hours longer than Super Typhoon HATO in August last year.

3. MANGKHUT brought severe storm surge to the territory despite the fact that the maximum storm surge level did not coincide with the time of the high tide. The increase in water level above the astronomical tide, as recorded at the tide stations in Quarry Bay (QUB) and Tai Po Kau (TPK), reached 2.35 metres [1] and 3.38 metres

[1] Figures in this paragraph are provisional and subject to changes after the detailed analysis by the Hong Kong Observatory.

respectively, which was the highest since automatic tidal records began at QUB and TPK. The maximum water level reached 3.88 metres and 4.69 metres (above Chart Datum) at QUB and TPK respectively, which was second to the record high of 3.96 metres and 5.03 metres set by Super Typhoon WANDA (1962) at the respective tide stations. The storm surges led to inundation of many low-lying coastal areas.

4. MANGKHUT caused serious damage to the community. There were approximately 46 500 reports of fallen trees (almost nine times the figure of HATO) and 500 reports of broken windows (about three times over HATO). About 1 800 people sought refuge at Government shelters (about five times over HATO) and 458 were injured (about three times over HATO).

The Government's Mechanism in Dealing with Tropical Cyclones

5. In order to provide an effective and efficient response to TC and other natural disasters, the Government maintains a Contingency Plan for Natural Disaster (CPND) which sets out the Government's alert system and organisational framework for responding to such emergencies as well as the functions and responsibilities of each Government department and organisation. In addition to CPND, every relevant department has its own detailed operational plans/instructions guiding its professional decision making and operation.

6. The Emergency Monitoring and Support Centre (EMSC) under the Security Bureau (SB) will be activated if a TC Warning Signal No. 8 or higher is issued. As a coordinating, monitoring and support centre for the Government during a major emergency, it discharges its role by collecting and collating updates from other Government departments, whilst other departments maintain their own emergency centres or contact points and discharge their own functions.

7. The concept of CPND allows each department to operate under its own professional areas and execute its plan whilst central situation reports are produced regularly by EMSC to present an overall picture to the relevant principal officials and allow the coordination of resources among the departments.

The Government's Preparations for MANGKHUT

Early Coordination

8. Based on the assessment from the Hong Kong Observatory that MANGKHUT would pose significant threats to the community, SB commenced coordination amongst departments when MANGKHUT was still over 800 kilometres away from Hong Kong and no TC Warning Signal was yet hoisted.

9. Two inter-departmental meetings chaired by the Secretary for Security (S for S) were held on 12 and 14 September 2018 to review the preparedness of the Government departments and agencies for MANGKHUT. Representatives from over 30 bureaux/departments and public utilities attended. The meetings discussed issues on response plans, monitoring and co-ordination, preventive measures, information flow and early public warnings. The departments and agencies were urged to prepare for the worst and be prepared to mobilise the maximum amount of resources for emergency response.

10. All relevant departments had taken prompt precautionary measures. For example, the Food and Environmental Hygiene Department (FEHD) and Drainage Services Department (DSD) mobilised additional resources to step up cleansing services to check that roadside gullies, drains and channels are unobstructed and clear of debris, particularly at the flooding blackspots. Hundreds of construction sites, slopes, catchwaters and Government facilities were inspected prior to the hoisting of Warning Signal No. 3 to ensure the safety of the structures and their proper functioning.

11. To better prepare for the emergency relief support, the Social Welfare Department (SWD) delivered in advance additional emergency relief items to 14 districts and activated hotline services.

12. To facilitate early evacuation of residents in flood-prone areas, 48 temporary shelters were opened by the Home Affairs Department (HAD) upon hoisting of TC Warning Signal No. 3.

Transportation was also provided in certain low-lying areas to convey residents to these shelters.

13. The Labour Department (LD) issued a series of press releases and announcements, reminding employers to draw up prior work arrangements and contingency measures for staff during and after typhoon in accordance with the "Code of Practice in times of Typhoon and Rainstorms".

Early Public Alert and Warning

14. On 14 September 2018, S for S and representatives of a number of departments held a joint press conference to alert the public to the potential threats of MANGKHUT, provide advice on protective measures and highlight the Government's preparation and emergency response. All relevant departments also alerted their service targets and stakeholders to the potential risks and precautionary measures available. HAD operated a round-the-clock hotline immediately following the hoisting of TC Warning Signal No. 1 for public enquiries. The relevant departments visited flood-prone areas to raise awareness and appeal for early evacuation where necessary.

15. To safeguard the safety of existing buildings and building works in progress, the Buildings Department (BD) issued circular letters to property management agents, registered building professionals and registered contractors on 12 September 2018 reminding them to check the safety of and take precautionary measures for gondolas for buildings and scaffolding and cranes in the sites under their management. They were also advised to arrange for inspection and necessary repair works as soon as practicable after the passing of MANGKHUT.

16. On 13 and 14 September 2018, BD mounted a special operation to inspect and remove seriously-dilapidated signboards. BD also inspected 74 active construction sites posing higher risks to public safety under typhoon and reminded their site personnel to complete rectification works as soon as practicable and before the typhoon approached. In addition, BD reminded its outsourced consultants and government contractors assigned for default works to enhance the safety

and precautionary measures for these works.

Advance Activation of EMSC

17. For the first time, EMSC was activated by SB when only TC Warning Signal No. 3 was hoisted on 15 September 2018. Following the activation of EMSC, the relevant departments also activated their emergency plans and emergency control centres (ECCs). The early activation of EMSC served to better alert bureaux and departments to the overall situation and coordinate the preparatory work and response among bureaux and departments.

18. The Development Bureau (DEVB) requested all works departments, public works contractors and consultants to keep up vigilance against the threats of MANGKHUT, and to implement all the necessary precautionary measures on sites and gear up with their emergency teams to prepare for the arrival of MANGKHUT. Further, all public works construction sites were inspected by the respective works departments by 15 September 2018 to ensure that the precautionary measures were in place.

19. The Tree Management Office (TMO) of DEVB asked tree management departments to carry out site checking and undertake necessary precautionary measures for trees in areas of high pedestrian and traffic flows, such as removing dead branches, removing trees with structural defects, or cordoning off areas pending mitigation work, etc. TMO also reminded private property owners, owners' corporations and property management companies to do the same.

20. The Architectural Services Department (ArchSD) reminded all their staff and contractors to gear up the precautionary measures in advance at their works sites for the possible adverse weather. A total of 58 capital works and minor works sites, and over hundreds of existing government buildings/ facilities were inspected before the super typhoon. Preparation works completed included but not limited to securing temporary structures (particularly bamboo scaffoldings); precautionary measures against flooding and damage to catchwaters, erosion of slopes and landslides, and tree failures; and activating their Site Emergency

Management Team of each new works site and Emergency Centre for handling emergency incidents in existing government buildings/ facilities under their maintenance etc.

21. The Geotechnical Engineering Office (GEO) of the Civil Engineering and Development Department (CEDD) completed inspection of about 200 government substandard slopes, which were being upgraded under the Landslip Prevention and Mitigation (LPMit) Programme. As it was expected that MANGKHUT would cause heavy rainfall, precautionary measures, such as covering slopes with tarpaulin and clearing the surface drains, were completed by contractors ahead of the arrival of MANGKHUT. GEO also urged private owners to clear all surface drains of their slopes before the arrival of MANGKHUT. Further, the frequencies of the Announcement in the Public Interest (API) on landslip warning were significantly increased, reminding the public to take necessary precautionary measures during heavy rain. The public was urged to keep away from slopes and stay in rooms on higher floors and/or furthest away from slopes during heavy rain, particularly when landslip warning was in force. The public was also strongly requested to cooperate with the Government and evacuate immediately if asked owing to landslide danger.

22. The Civil Engineering Office (CEO) of CEDD liaised closely with their maintenance term contractors since the hoisting of TC Warning Signal No.1 on 14 September 2018. When TC Warning Signal No. 3 was hoisted, CEO's term contractors set up their Emergency Team and made available all necessary resources to ensure the full functioning of the Emergency Team for undertaking emergency works.

23. DSD conducted pre-typhoon preparation work including inspection and drain clearance for more than 150 locations vulnerable to blockage of refuse or leaves. DSD also implemented measures to the seven previously identified sites prone to serious inundation, including Luen On San Tsuen, Kar Wo Lei, Sham Tseng San Tsuen, Lei Yue Mun Praya Road, Sai Kung Nam Wai, Tai O and the coastal village areas at the northwest boundary of Yuen Long District. For example, in Lei Yue Mun, demountable flood barriers had been installed at 14 designated locations to alleviate flooding before the predetermined alert sea level

was reached. In Tai O, DSD commenced the installation of 350 metres demountable flood barriers on the top of riverwall to raise the protection level to +3.8mPD at Wing On Street and South of Tai Ping Street on 14 September 2018 for advance completion before the approach of MANGKHUT.

24. In addition to the above, Heng Fa Chuen was also vulnerable to the impact of the wave owing to its proximity to the waterfront. To alleviate the impact on the local resident areas caused by the wave, relevant departments jointly set up a liaison mechanism with the management office of Heng Fa Chuen. DSD also conducted a meeting on 13 September 2018 with the management office of Heng Fa Chuen to alert them on the flood risk and exchange information on flooding prevention measures.

25. The Water Supplies Department (WSD) took precautionary measures to minimise the risk of the impact of the typhoon on the water supply, in particular, damage to waterworks installations including water treatment works and pumping stations. In addition, WSD carried out inspections and clearance of the catchwaters to ensure that they were free from blockage, thus minimising the risk of overtopping from the catchwaters. As a contingency measure, WSD kept topping up the service reservoirs during the typhoon so as to maintain the water supply by the storage in the service reservoirs in case of emergency in the upstream water treatment works, pumping stations etc. affecting the inflow to the service reservoirs.

26. The Electrical and Mechanical Services Department (EMSD) ECC was also activated on 15 September 2018 when TC Warning Signal No. 3 was hoisted.

Emergency Response in the Course of Typhoon

27. The manpower and resources of emergency departments, including the Hong Kong Police Force (HKPF), Fire Services Department (FSD) and Civil Aid Service (CAS), were mobilised to their maximum capacities during emergency response stage. The 999 hotlines of HKPF

received some 8 000 calls, a three-fold increase over Typhoon HATO. Approximately 8 000 police officers were deployed to respond to a total of 6 922 typhoon related cases. FSD responded to a total of 587 fire calls and 1 241 special service calls (such as tree collapses, people shut-in-lifts and flooding) which were respectively 97% and 219% more than those recorded during HATO. In order to cope with the demand, FSD redeployed an additional 150 members from various units.

28. The flood-prone areas were hard hit by the storm surge when MANGKHUT swept across Hong Kong. In Lei Yue Mun and Tai O, FSD, together with other rescue departments, evacuated 28 and 129 people to safety respectively.

29. ArchSD's Site Emergency Management Teams, comprising contractors' site management, site supervisory staff and project management officers, were activated for reporting of emergency incidents and coordinating emergency actions for new works sites. When TC Warning Signal No. 3 was hoisted, ArchSD's Emergency Centre manned by professional and site supervisory staff was activated for handling emergency incidents in existing government buildings/ facilities under our maintenance. During the course of typhoon, about 1930 cases of building/structure/facilities failures or related issues were received.

30. GEO's ECC was put into operation at 4:00 pm on 15 September 2018. A total of about 80 GEO staff were mobilised. In addition, GEO received reports of a total of 19 landslide incidents as a result of the damage of MANGKHUT. Advice on necessary follow-up actions for safeguarding public safety against landslide hazards, including precautionary measures and emergency repair works, were provided to the relevant government departments.

31. CEO closely monitored the situation of the marine facilities (including ferry piers, public piers/landings, breakwaters and seawalls) in the course of typhoon for early implementation of necessary emergency repairs or temporary works.

32. During the operation of ECC, DSD deployed more than 50 emergency gangs to handle the flooding cases. Emergency gangs were

also stationed at the sites prone to serious inundation to continuously monitor the flooding situation and implement flood alleviation measures such as removal of blockage at drains and dewatering in accordance with the contingency plans. Despite hoisting of TC Warning Signal No. 10, DSD deployed four emergency gangs to alleviate flooding in Shing Tai Street of Heng Fa Chuen.

33. WSD set up two regional emergency coordination centres to co-ordinate actions for handling emergency incidents related to water supply in Hong Kong and Islands, and Kowloon and New Territories respectively. Moreover, additional staff of WSD and contractors were deployed for standby. While the water supply in the territory was maintained normal in general during the typhoon, some waterworks facilities were affected by power outage or damaged by the typhoon with some of them causing disruption to the water supply in some areas and villages. As soon as weather permitted and before the lowering of TC Warning Signal No. 8, WSD carried out emergency repairs with a view to minimising the disruption to the water supply (e.g. Cheung Chau which managed to isolate the pipeline damaged by fallen trees and carried out urgent valve operations, thereby minimizing the extent and duration of water supply disruption to Cheung Chau before full recovery). In addition, WSD noted that fresh water supply to some individual housing estates was suspended owing to damages to their inside service. WSD had contacted the management offices of these housing estates and provided temporary water supply (e.g. water wagons, water tanks or standpipes) to these estates.

34. EMSD established 120 decentralised Emergency Response Teams (ERTs) with around 500 staff residing in various government premises across the territory to provide emergency electrical and mechanical (E&M) services to bureaux/departments. Recovery vehicles and E&M equipment were made available for use by the ERTs. EMSD received around 1 100 requests for assistance relating to government E&M facilities and vehicles, and provided timely response to bureaux/departments throughout the typhoon.

35. In BD, a total of 128 professional and technical staff were mobilised in shifts. A total of 24 emergency cases such as collapse of

temporary facilities on construction sites and dangerous signboards were received and attended to.

36. During this period, HAD operated five more temporary shelters, bringing the total to 53.

37. In order to ensure student safety, the Education Bureau (EDB) announced on 16 and 17 September 2018 class suspension for all schools on 17 and 18 September 2018 respectively. Besides, the eight University Grants Committee (UGC)-funded universities suspended class on 17 September 2018 and resumed normal on the next day.

38. With the concerted efforts of the relevant departments in particular emergency rescue services, the casualty was kept to the minimum. There was no fatality during MANGKHUT.

Post-typhoon Recovery and Restoration Efforts

39. The damages of MANGKHUT to Hong Kong were extensive and unprecedented. Collapse of trees caused extensive road blockage, leading to serious impediment to traffic and public transport services. Strong wind and storm surges brought different degrees of damages to a wide range of public facilities. The recovery and restoration have taken longer time and resources than in previous typhoons. The following paragraphs highlight major Government recovery and restoration efforts.

Public Transport

40. On the transport front, the Emergency Transport Coordination Centre (ETCC) of the Transport Department (TD), which monitored and handled traffic and transport incidents around the clock each day, stepped up its mode of operation when TC Warning Signal No. 3 was hoisted on 15 September 2018 to closely monitor the tropical cyclone pre-warnings issued by the Hong Kong Observatory and stand ready to co-ordinate with public transport operators and information dissemination to the media and members of the public during and after

the typhoon. When TC Warning Signal No. 10 was hoisted on 16 September 2018, ETCC was escalated to Joint Steering Mode (JSM), with the presence of HKPF and the Highways Department (HyD)[2], for more efficient communications on road inspection, assessment on impact of road blockages and the priority of clearance works. ETCC also closely communicated with EMSC every two hours and disseminated the latest traffic and transport information to the public from time to time.

41. MANGKHUT had brought severe damage to the public transport network and facilities (including railways, roads and piers). Since the small hours of September 17 when TC Warning Signal No. 8 was in force, TD, HyD, CEDD, FSD, ArchSD, Marine Department, EMSD, WSD, FEHD and public transport operators had been working at full strength, including clearing blocked roads, reinstating traffic lights, and repairing public piers, etc. so as to restore public transport services as early as practicable. Once noting that the TC Warning Signal would be lowered from No. 8 to No. 3 in the morning of 17 September, TD liaised with the franchised bus companies so that the latter could arrange bus trial runs, once weather conditions permitted, so as to get prepared for the resumption of bus services. Unfortunately, while most of the trunk roads had been cleared for traffic before dawn, owing to the unprecedented massive fallen trees over the territory including areas in the vicinity of the bus depots and along many local roads, bus services could not readily resume. Besides, the MTR East Rail Line (Tai Po – Sheung Shui section) and Light Rail (Tin Shui Wai and Yuen Long sections) could not resume service in the morning of 17 September owing to extensive fallen trees and obstacles on tracks and damage to overhead lines. The Government and the public transport operators immediately alerted the public through various channels, including press releases, online platforms and mobile apps (i.e. TD's HKeMobility)[3]. After noting that the MTR Tai Wai Station subsequently experienced electricity supply disruption resulting in reduced service between the Hung Hom –

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[2] In view of the potential threats that might be brought about by MANGKHUT, HyD had stationed about 500 workers at their various depots before the typhoon attack to cater for the post-typhoon clean up works. This level of resources ready at depots for immediate deployment was 50% higher than that for all previous similar incidents.

[3] ETCC issued the first press release at 0544 hours on 17 September 2018 after the typhoon signal downscaled to No. 3 at 0520 hours to advise the public on the public transport services. By around noon of the day, five sound bites had been arranged at radio stations since 0630 hours, and nine press releases issued to update the public of the latest traffic and transport situation.

Shatin Section later that morning, ETCC had kept in close liaison with MTRCL regarding its repair, contingency and crowd control arrangements. MTR East Rail Line resumed full service on 17 September evening and Light Rail resumed full service on 18 September morning. With concerted efforts of departments concerned[4], about 30% of the franchised bus services were resumed on 17 September night and over 95% resumed service on 18 September (with the last one on 22 September).

42. In view of the traffic disruption following the lowering of the TC Warning Signal No. 8, HAB arranged 24 coaches and two ferries to provide transportation services to the public in some districts. There were around 3 350 passengers and 200 passengers respectively taking the shuttle buses and ferries during the period from 17 to 19 September 2018.

43. LD issued in the morning of 17 September 2018 a press release to urge employers to show understanding and flexibility in handling employees who could not resume work on time due to road and traffic conditions.

Follow-up by Works Departments

44. ArchSD inspected all their capital works and minor works sites after the passing of MANGKHUT. The damage was relatively small without significant effect to the public. For the existing government buildings/ facilities, ArchSD had immediately liaised with relevant user departments for following up their reported cases and the related remedial works to major/ seriously damaged facilities and prioritise/ schedule the works.

45. GEO had mobilised about 100 geotechnical engineers and consultants to check the site conditions of about 200 government slopes which were being upgraded under the LPMit Programme. No landslides were found on these sites and some necessary follow-up actions on these sites had been taken by the contractors. Each landslide incident was

[4] Road clearance works had been ongoing day and night since 17 September. Priority was given to works relating to the prompt resumption of public transport services. For example, major roads, roads leading to bus depots, roads connecting railway stations and roads in the areas with no alternative routes were given top priority.

inspected by geotechnical engineers of GEO and follow-up actions were undertaken by the relevant departments.

46. CEO mobilised seven teams of 45 frontline staff to inspect 78 important marine facilities within days. Of the 78 important marine facilities inspected, follow-up repair works would be required for five facilities.

47. DSD commenced urgent inspection and clearance of roadside gullies at major roads in advance of the lowering of TC Warning Signal No. 8 (when the weather conditions permitted) so as to reduce the effect of flooding on public land transport services. DSD also inspected and carried out clearance works to major stormwater intakes. Urgent inspection and follow-up actions to the multi-part manhole covers on carriageways and pedestrian passages in coastal area had been conducted. In Heng Fa Chuen, DSD deployed six gangs of labours with pumps to assist the management office to dewater the flood water from the lift pits of 20 blocks on 17 September 2018.

48. WSD resolved all water supply interruptions and normal water supply to all once affected areas resumed. WSD also had completed all emergency repair works to waterworks (including those in remote areas) damaged or affected by power outage and loss of remote control over waterworks facilities caused by broadband failure during the typhoon. Repair works in some of the cases (such as Tap Mun, Kat O and Ap Chau, etc.) were difficult because they were in the remote areas where access (e.g. blocked by fallen trees), transportation of materials and tele-communication were difficult. In these cases, temporary water supply by means of water vessels, water tanks and large bottled water had been provided to the residents during the water suspension period.

49. BD mounted a large scale operation to survey all major streets to identify and remove any potential danger arising from loose signboards, projections, windows, scaffoldings or other building defects. For cases whereby building owners could not follow up on the dangers promptly, Government contractors were mobilised to remove the dangers identified. In total, over 860 incidents were identified or reported and were rectified under the operation. Furthermore, BD attended to 13

emergency calls concerning dangerous private slopes and rectification works on these cases were in progress. BD also inspected 56 construction sites to remind registered contractors and registered building professionals to check and ensure safety of the scaffolds and facilities on site.

Community Relief

50. EDB provided urgent assistance to over 380 affected aided schools to promptly remove/repair those facilities which were damaged by MANGKHUT. Through cooperation with schools and relevant departments, the fallen trees or road blockage which affected access to school campus or caused imminent danger to students were cleared. To help lessen the financial burden on schools, EDB announced on 27 September 2018 a Special Grant on Typhoon Disturbance to schools. Each affected public sector school and Direct Subsidy Scheme school can apply for an amount up to $150,000. As for kindergartens which have joined the Kindergarten Education Scheme, they can also apply for up to $50,000 to meet their urgent needs.

51. The Government provides emergency relief funds from the General Chinese Charities Fund and/or Special Aid Fund to those affected by the typhoon. Over 560 applications have been received by HAD.

Clearance of Debris and Fallen Trees

52. The Government accorded top priority to the removal of fallen trees and other debris which posed imminent hazards to public safety and impeded traffic flow in major thoroughfares. To augment the clearance operations, for example, FSD suspended all training courses and redeployed 180 members to such operations. CAS was also mobilised to remove fallen trees from the blocked thoroughfares.

53. In addition to over 10 000 workforce mobilised by the Government each day on clearance operations, volunteers from various sectors across the community, including the disciplined services, joined in clearing fallen trees and debris. Although clearance operations of

some pavements and roads in the territory are still underway, HyD has cleared and reopened all strategic roads and the roads leading to/from bus depots on 18 September 2018. Most of other roads blocked by fallen trees were cleared for vehicular traffic on or before 22 September 2018.

54. On the part of FEHD, a workforce of about 8 000 has been mobilised each day for clearing typhoon debris and other cleansing services. Between 17 September and 1 October 2018, in collaboration with other departments and volunteers, FEHD has cleared a total of over 9 500 tonnes of typhoon debris and another 241 lorry-times of wood waste.

55. The strong winds of MANGKHUT have caused extensive tree deformation or breakage. Up to 26 September, there are 46 531 reports of fallen trees. After passage of the typhoon, tree management departments immediately carried out re-inspections of trees in areas with high pedestrian and traffic flows (up to 26 September, more than 424 000 trees have been inspected) and implemented prompt mitigation measures to protect public safety, including stabilising 19 364 trees such as pulling back tilted trees into upright position and guying and prodding trees, removing hanging branches, removing 31 158 unstable trees, cordoning off 21 879 trees pending remedial work, etc. So far, all trees in community facilities and public housing estates and 70% of roadside trees have been inspected. The rest will be completed by early October. Some 9 700 staff members from the Government departments and contractors have taken part in the exercise. Reports of problem trees received through Government hotlines are dealt with as soon as possible.

56. The Government also conducted land/sea-based and air-borne surveillance to monitor the distribution and extent of surge of marine refuse. It was observed that the eastern and southern parts of Hong Kong were more affected. The Marine Department has collected approximately 700 tonnes of marine refuse at sea and will continue with its cleansing efforts.

57. After passage of MANGKHUT, the daily waste intake recorded at both landfills and refuse transfer stations (RTSs) had increased by 30 – 40% in the ensuing few days, reaching over 20 000

tonnes per day for the landfills and 12 300 tonnes per day for the RTSs respectively, presenting huge challenges to the landfill and RTS operations. Machinery malfunctions partly owing to the handling of a huge amount of big broken twigs also undermined RTSs (which are designed to handle largely municipal solid waste and only a small proportion of yard waste) to various extent and hence led to longer waste processing time and queuing time of refuse collection vehicles at RTSs. To cope with the situation, the Environmental Protection Department (EPD) has deployed more resources and manpower to RTSs, increased the marine trips for transferring waste between the West New Territories (WENT) Landfill and RTSs, and disseminated information on waiting time at RTSs and other important messages to relevant Government departments and the private waste collectors/contractors through the waste-hauling representatives or the trade. To meet the heavy demand for waste disposal outlets and transfer service, EPD has also flexibly extended the operation hours of the WENT Landfill and the Northeast New Territories Landfill as well as the six RTSs (excluding the Outlying Island Transfer Facilities for which there was no such demand) since 17 September 2018.

58. EPD has also set up a temporary wood waste collection area in the Kai Tak Development Area on 21 September 2018 so as to divert fallen trees from RTSs. The efficiency of the operation of RTSs has been largely restored after the implementation of the wood diversion scheme, leading to a significant reduction of the waiting time of waste collection vehicles at various RTSs. In order to make good use of the wood waste, EPD will take out a suitable portion for processing into compost for use by the Organic Resources Recovery Centre at Siu Ho Wan. Members of the public who are interested in using the wood waste may collect such materials free of charge. As at 28 September 2018, 238 organisations or members of the public made calls to express interest in reusing the stockpiled wood waste, and 21 of them have collected the wood waste from the collection area.

Sewage Treatment

59. The seawall at Sai Kung Sewage Treatment Works and its secondary treatment process facilities were damaged during

MANGKHUT. Upon completion of the emergency repair works by DSD on 24 September, the primary treated sewage effluent has been disinfected and diverted back to the submarine outfall for dispersed discharge and dilution to minimise potential impact. The Government will continue to closely monitor the water quality at nearby waters and beaches and upload test results regularly to its website. The Ap Lei Chau Preliminary Treatment Works (ALCPW) and three sections of sewage rising mains (RMs) in Southern District were also damaged by MANGKHUT. ALCPW resumed normal operation on 18 September and the replacement works of the three damaged RMs were completed on 29 September.

Way Forward

60. With global warming, sea level rise and the expected increase in extreme weather conditions, Hong Kong may be hit by typhoons of strengths and impact similar to or even stronger than MANGKHUT in future. The Chief Executive has tasked S for S to coordinate a review of the handling of such strong typhoons. The review is underway and covers, among others, the following issues -

I) Review of Contingency Response Plans

61. The Government will re-examine our work on the prevention of damages, emergency response and recovery and restoration in relation to TCs to identify room for improvement in view of the experience of MANGKHUT.

II) Post-typhoon Recovery and Restoration

62. MANGKHUT caused extensive damages unseen in decades. In particular, the serious disruption to and difficulties in the resumption of public transport services as well as clearance of roads after the typhoon posed a serious problem to the resumption of work and normal life for general members of the public. The Government will consider how best to deal with similar situations in future.

III) External and Internal Information Dissemination

63. Effective and timely communication with the public is of paramount importance before, during and after TCs in providing information on precautionary measures and the state of recovery and restoration. A number of departments have been making effective use of mobile technology and social media in public communication. Within the Government, we will review the mechanism of coordination and communication across bureaux, departments, public utilities as well as other stakeholders whose work has an impact on recovery and restoration to bring the community back to normal operation as soon as possible.

Conclusion

64. The Government will strive to strengthen, on a continuous basis, our preparedness for and response to natural disasters, as well as our capability for recovering and restoring work after such disasters.

Chief Secretary for Administration's Office
Commerce and Economic Development Bureau
Development Bureau
Education Bureau
Environment Bureau
Food and Health Bureau
Financial Services and the Treasury Bureau
Home Affairs Bureau
Labour and Welfare Bureau
Security Bureau
Transport and Housing Bureau

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